Indian Institute of Technology Delhi

School of Interdisciplinary Research (SIRe)

SIRe Project Number

2022-01-30

(will be assigned by SIRe)

PhD Project

Project Details	
Project Title	Cellular response to air pollution exposure: A pathway to understand the biological pathway of health impacts
Project Summary	Exposure to air pollution is the second largest health risk in India. Recent studies have shown that the health burden of air pollution in India is enormous, linking air pollution exposure to child and adult mortality, anemia, child growth failure (e.g., stunting and wasting), cardio-vascular and pulmonary diseases. Though evidence is clear, the biological pathway of the various disease outcomes attributable to air pollution is not understood. Moreover, how such disease burden varies with sectoral contributions is poorly known. This project aims to fill this gap. The student is expected to examine the impact of air pollution at cellular level and study its sensitivity to mass, number and size of particulates. A comprehensive toxicological analysis of the specific air pollutants on cancer cell lines will be carried out to study their impact on cancer development and progression. The cellular response to air pollution could unravel the pathways through which the diseases develop and help the scientists to develop predictive models of disease burdens.

PhD Supervisors

Role	**Faculty**	**Academic Unit in IITD**	**Email ID**
Supervisor 1	Sagnik Dey	Centre for Atmospheric Sciences, IITD	sagnik@cas.iitd.ac.in
Supervisor 2	Ritu Kulshreshtha	Department of Biochemical and Biotechnology, IITD	ritu@dbeb.iitd.ac.in

Project requirements (Student qualifications, experience required, etc)

- MSc or MS(R) with GATE/NET/DST-INSPIRE or MTech in relevant discipline.
- Experience in mammalian cell culture and molecular biology techniques is required.
- Experience on exposure modelling/epidemiological studies using Python/R/Matlab is desired.

Source of funding (IRD/FITT Project details, if any)

We would prefer candidates with their own fellowships, until the supervisors acquire funding through external source. Otherwise, we can support from RP04105G.

Role of Faculty Members involved:

This is a true interdisciplinary project requiring expertise on exposure modelling and biological analysis. Prof Dey will supervise the exposure and predictive modelling, while Prof Kulshreshtha will supervise the biological component of the project. Both the supervisors will be involved in the analysis.